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A Guide to the New Tubes

PART 2

By the Engineering Department, Aerovox Corporation

This issue of the Research Worker concludes the list of new tubes. The first part of this list was given in the June, 1939 issue.

LIST OF TUBES

(Concluded)

1N5G, 1N5GT, an r.f. pentode for r.f., i.f., and a.f. amplification. It can be used in a.v.c. controlled circuits. Characteristics: Ef, 1.4; If, 0.05; Ci, 2.2; Cgp (with tube shield), 0.007; Co, 9.0; Ep, 90; Eg2, 90; Eg1, to F-; Ip, 1.2; Ig2, 0.3; Rp, 1.5; Gm, 750; mu, 1160; Gm at -3.2 v., 50; Gm at -4 v., 5. Bulb T9-C for 1N5G, T9-E for 1N5GT; base diagram 5Y, same as 1D5GP, 1E5GP.

1P5G, an r.f. pentode. Characteristics: Ef, 1.4; If, 0.05; Ep, 90; Eg2, 90; Eg1, to F-; Ip, 2.3; Ig2, 0.7; Rp, 0.8; Gm, 800, mu, 640. Bulb T9-C and base diagram 5Y both the same as 1N5G.

1Q5G, 1Q5GT, a beam power amplifier. Characteristics: Ef, 1.4; If, 0.1; Ep, 90; Eg2, 90; Eg1, -4.5; Ip, 9.5; Ig2, 1.6; Gm, 2100; RL, 8000, PO, 0.27 at 7.5%. Bulb T9-B for 1Q5, T9-D for 1Q5GT; base diagram 6AF: 1, NC; 2, F+; 3, P; 4, G2; 5, G1; 7, F-; 8, NC.

2A4G, a hot-cathode, argon-filled triode with great constancy of characteristics even with large variations in ambient temperature. Characteristics: Ef, 2.5; If, 2.5; Ep maximum (instantaneous), 200 volts both forward and reverse; Ip max. peak, 1.25 amp.; Ip max. average, 0.1 amp.; maximum averaging time, 45 seconds; tube voltage drop, 15; cold starting time, 2 seconds. The maximum allowable voltage between any two elements, is 250 volts. Bulb ST-12, base diagram, 6Q, same as 6C5G.

2W3, a half-wave rectifier. Characteristics: Ef, 2.5; If, 1.5; Ep max., 350 ac rms; Ip max., 55. Metal shell, 8B1; base diagram 4X: 1, shell; 2, F; 4, P; 6, NC; 8, F.

6A8GT, pentagrid converter in bulb T9-E; characteristics and base connections same as 6A8G.

6AB7, same as 1853.

6AC5GT, same as 6AC5G except for bulb T9-D.

6AC7, same as 1852.

6AD6G, double tuning indicator tube. Characteristics: Ef, 6.3; If, 0.15; Target, 150 volts max., 100 volts min.; ray control supply voltage, 150 max.

Typical operating conditions: Target voltage, 150; ray control voltage for 0 deg. shadow, 75; for 90 deg. shadow, 8. Base diagram 7AG: 1, NC; 2, H; 3, ray control; 4, ray control, 5, target; 7, H; 8, K. Tubular bulb max. overall height, 2-7/8 inches; max. diameter, 1-3/16 inches.

6AF5G, 6AF5GT triode voltage amplifier especially designed as driver for the 25AC5G in dynamic-coupled circuit. Characteristics as class A amplifier: Ef, 6.3; If, 0.3; Ep, 180 max.; Eg, -18; Ip, 7; Gm, 1500; mu, 7.4; Rp, 4900. As dynamic-coupled amplifier: Ep, 165; Ip, 6.6; cathode connected to grid of 25AC5G and through 25000 ohms to cathode of 25AC5G and ground. Bulb St-12 for 6AF5G, T9-D for 6AF5GT; base diagram 6Q, same as 6C5G.

6AF6G, double tuning indicator tube. Characteristics: Ef, 6.3; If, 0.15; Target supply voltage, 135; ray control voltage for shadow of 0 deg., 81; for shadow of 100 deg., 0. Bulb T9-H, base diagram 7AG, same as 6AD6G.

6F5GT, 6J5GT, 6J7GT, 6K6GT, 6K7GT, 6K8GT, have the same characteristics as the corresponding G-tubes except for T9-D and T9-E bulbs.

6P5G, 6P5GT, general purpose triode. Characteristics as amplifier: Ef, 6.3; If, 0.3; Ep, 250 max.; Eg, -13.5; Ip, 5; Gm, 1450; Rp, 9500, mu, 13.8.

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ST12 and T9-D bulbs; base diagram 6Q, same as 6C5G.

6Q7GT, same as 6Q7G but T9-E bulb.

6SA7, 6SA7GT, single ended pentagrid converter. Characteristics: Ef, 6.3; If, 0.3; Ci (rf), 9.5; Co (mix), 12; Ci (osc), 7; Cg3p, 0.13; Cg1g3, 0.15; Cg1p, 0.06; Ep, 250 max.; Eg2g4, 100 max.; Ik, 14 max.; Eg3, 0 for self excitation, -2 volts when separately excited; Eg5, 0; oscillator grid leak, 20,000 ohms; Rp, 0.8; conversion conductance, 450; conv. cond. for -35 v. control grid bias, 5; Ip, 3.4; Ig2g4, 8; Ig1, 0.5. The 6SA7 has metal shell 8G-1, the 6SA7GT glass bulb T9-D. Base diagram 8R: 1, shell and G5; 2, H; 3, P; 4, G2G4; 5, G1; 6, K; 7, H; 8, G3.

6SC7, twin triode amplifier with common cathode. Ef, 6.3; If, 0.3. Characteristics of each triode unit: Ep, 250 max.; Eg, -2; mu, 70; Gm, 1325; Rp, 0.053; Ip, 2. Typical operation as phase inverter: plate supply, 300 v.; RL, 25,000; Rg for following stage, 0.5 meg.; Rc, 1675 ohms; output, 55 volts peak; gain, 42. For 100-volt service, Rc, 3750; output, 9; gain 30. Shell 8G-1, base diagram 8S: 1 shell; 2, P (T2); 3, G (T2); 4, G (T1); 5, P (T1); 6, K; 7, H; 8, H.

6SF5, single-ended metal high-mu triode with characteristics identical to 6F5. Shell 8G-1; base diagram 8P: 1, shell; 2, K; 3, G; 4, NC; 5, P; 7, H; 8, H.

6SJ7, single-ended metal pentode amplifier with sharp cut-off. Characteristics: Ef, 6.3; If, 0.3; Ep, 250 max.; Eg2, 100 max.; Ip, 3; Ig2, 0.8; mu, 2500; Rp, 1.5; Gm, 1650. Shell 8G-1, base diagram 8N: 1, shell; 2, H; 3, G3; 4, G1; 5, K; 6, G2; 7, H; 8, P.

6SK7, single-ended metal pentode with remote cut-off. Characteristics: Ef, 6.3; If, 0.3; Ci, 6; Cgp, 0.005; Co, 7; Ep, 250 max.; Eg2, 100 max.; Eg1, -3 min.; Ip, 9.2; Ig2, 2.4; mu, 1600; Rp, 0.8; Gm, 2000; Gm, 10 at -35 volts bias. Shell 8G-1, base diagram 8N, same as for 6SJ7.

6SQ7, single-ended metal duo-diode high-mu triode. Characteristics: Ef, 6.3; If, 0.3; Ci, 4.2; Cgp, 1.8; Co, 3.4; Ep, 250 max.; Eg, -2; mu, 100; Rp, 0.091; Gm, 1100; Ip, 0.8. Shell 8G-1, base diagram 8Q: 1, Shell; 2, G, 3, K; 4, diode plate; 5, diode plate; 6, P (triode); 7, H; 8, H.

6V6GT, same as 6V6G except for T9-D bulb.

6X5GT, same as 6X5G except for T9-D bulb.

7A4, a general purpose triode. Characteristics: Ef, 7.0; If, 0.32; Ep, 250 max.; Eg, -8; Ip, 9; Rp, 7700; Gm, 2600; mu, 20. Bulb, T9-G; laktal base;

socket connections (5AC): 1, H; 2, P; 3, NC; 4, NC; 5, NC; 6, G; 7, K; 8, H.

7A5, beam power amplifier. Characteristics: Ef, 7.0; If, 0.75; Ep, 125 max.; Eg2, 125 max.; Eg1, -9.0; Ip, 37.5; Ip (max. signal), 40.0; Ig2, 3.2; Ig2 (max. signal), 8.0; Gm, 6100; Rp, 17000; RL, 2700; PO, 1.9 at 11% total harmonic distortion. Bulb T9-F, laktal base, socket connections: 1, H; 2, P; 3, G2; 4, NC; 5, NC; 6, G1; 7, K; 8, H.

7A6, duo-diode similar to 6H6G. Characteristics: Ef, 7.0; If, 0.16; Cplp2, 0.05; Ep, 150 ac rms max.; max. d.c. output current, 10; voltage drop per side at 10 ma., 8. Bulb, T9-G, laktal base, socket connections 7AJ: 1, H; 2, K1; 3, P1; 4, NC; 5, internal shield between the two diodes; 6, P2; 7, K2; 8, H.

7A7, r.f. pentode with remote cut-off characteristics. Ef, 7.0; If, 0.32; Ip, 8.6; Ig2, 2.0; other characteristics same as 6SK7. Bulb T9-G; laktal base, socket connections 8V: 1, H; 2, P; 4, G3; 5, internal shield; 6, G1; 7, K; 8, H.

7A8, octode converter. Characteristics: Ef, 7.0; If, 0.16; Cg4p, 0.15; Cg4g2, 0.12; Cg4g1, 0.12; Cg1g2, 0.60; Ci(rf), 7.5; Co(osc), 3.4; Ci(osc), 3.8; Co(mix), 9.0; Ep, 250 max.; Eg4, -3.0 min.; Eg3g5, 100 max.; Eg2, 250 max. applied through 20,000 ohm dropping resistor; oscillator grid leak, 50,000 ohms; Ip, 3.0; Ig2, 4.5; Ig3g5, 2.8; Ig1, 0.40; Rc, 300; Rp, 0.7; conversion conductance, 600; conv. cond. for -30 volts grid bias, 2. Bulb T9-G, laktal base, connections 8U: 1, H; 2, P; 3, G2; 4, G1; 5, G3G5; 6, G4; 7, K & G6; 8, H.

7B5, an intermediate power pentode with characteristics identical to those of type 41 except for the heater rating. Ef, 7.0; If, 0.425; bulb, T9-F; laktal base, connections 8AE: 1, H; 2, P; 3, G2; 4, NC; 5, NC; 6, G1; 7, K & G3; 8, H.

7B6, duo-diode triode. Characteristics identical to those of type 75 except: Ef, 7.0; If, 0.32; Cgp, 1.5; Ci, 3.0; Co, 3.0. Bulb, T9-G; laktal base, connections 8W: 1, H; 2, P; 3, G; 4, K; 5, diode plate; 6, diode plate; 7, K (tied internally to pin 4); 8, H.

7B7, r.f. pentode with remote cut-off characteristics. Ef, 7.0; If, 0.16; Cgp, 0.005; Ci, 5.0; Co, 7.0; Ep, 250 max.; Eg2, 100 max.; Eg1, -3 min.; Ip, 8.5; Ig2, 2.0; Rp, 0.7; Gm, 1700; mu, 1200; Gm for -40 volts grid bias, 10. Bulb, T9-G; laktal base with connections 8Y: 1, H; 2, P; 3, G2; 4, G3; 5, internal shield; 6, G1; 7, K; 8, H.

7B8, pentagrid converter with characteristics similar to those of type 6A7 except for the following: Ef, 7.0; If, 0.32; Cg4p, 0.15; Cg4g2, 0.16; Cg4g1,

0.12; Cg1g2, 0.80; Ci(rf), 10.7; Co(osc), 3.4; Ci(osc), 4.6; Co(mix), 7.5; conversion conductance for -35 volts bias, 6. Bulb, T9-G; laktal base with connections 8X: 1, H; 2, P; 3, G2; 4, G1; 5, G3G5; 6, G4; 7, K; 8, H.

7C5, a beam power amplifier with characteristics similar to those of the 6V6 except for the heater rating: Ef, 7.0; If, 0.48. The bulb is type T9-G and the base diagram, 7AA is the same as for type 7A5.

7C6, a duo-diode high-mu triode. Characteristics: Ef, 7.0; If, 0.16; Cgp, 1.4; Ci, 2.4; Co, 3.0; Ep, 250 max.; grid resistor, 10 meg.; Ip, 1.3; Rp, 0.1; Gm, 1000; mu, 100. Bulb, T9-G; laktal base; connections (8W) the same as for 7B6.

7Y4, full-wave high-vacuum rectifier. The characteristics are the same as for type 84 except for the heater rating: Ef, 7.0; If, 0.53. Bulb T9-G; laktal base with connections 8AB: 1, H; 2, NC; 3, P; 4, NC; 5, NC; 6, P; 7, K; 8, H.

12A8GT, same as 12A8G but with T9-E bulb.

12B8GT, triode-pentode. Characteristics: Ef, 12.6; If, 0.3; C (pentode G1 to P), 0.15; Ci(pent), 5.2; Co(pent), 9.6; Cgp(tri), 2.3; Ci(tri), 5.0; Co(tri), 6.3; C(pentode G1 to triode G), .002; C(pentode P to triode G), .078; C(pentode G1 to triode P), .003. Pentode section: Ep, 90; Eg2, 90; Eg1, -3; Ip, 7.0; Ig2, 2.0; Rp, 0.2; Gm, 1800; mu, 360; Gm for -42.5 volt bias, 2. Triode section: Ep, 90; Eg, -1.0; Ip, 0.4; Rp, 0.0875; Gm, 1200; mu 105; Eg for plate current cut-off, -2.0. T9 bulb, octal base and cap. Connections: 1, Kp; 2, H; 3, Pp; 4, G2p; 5, Pt; 6, Kt; 7, H; 8, Gt; cap, G1p.

12C8, duo-diode pentode. The characteristics are identical to the 6B8 except for the heater rating: Ef, 12.8; If, 0.15. Shell, 8G-1 and base diagram 8E are the same as for 6B8.

12F5GT, 12J5GT, 12K7GT, 12Q7GT, 12SA7, 12SC7, 12SJ7, 12SK7, 12SQ7 are the same as the corresponding six-volt tubes except for the heater ratings: Ef, 12.6; If, 0.15.

25AC5G, high-mu power amplifier triode. Characteristics: Ef, 25.0; If, 0.3; Ep, 180 max.; plate dissipation, 10 max. Operating conditions: Ep, 110; Eg, +15; Ip, 45; Ig, 7; Rp, 0.0152; Gm, 3800; mu, 38. Operating conditions as class A dynamic coupled amplifier with 6AF5G driver: plate supply, 165 volts; grid connected to cathode of 6AF5G and through a 25000 ohm resistor to cathode of 25AC5G and ground; Ip, 46; Ip of driver, 6.6; input signal to driver, 18 volts rms; RL 3500; PO 3.3 at 10% total harmon-



ic distortion. ST12 bulb; base diagram: 1, NC; 2, H; 3, P; 5, G; 7, H; 8, K.

25B8GT, same as 12B8GT except for heater ratings: Ef, 25.0; If, 0.15.

25C6G, beam power amplifier. Characteristics: Ef, 25.0; If, 0.3; Ep, 200 max.; Eg2, 135 max.; max. plate dissipation, 12.5; max. screen dissipation, 1.75; Eg1, -14; Ip (zero sig.), 61; Ip (max. sig.), 66; Ig2 (zero sig.), 2.2; Ig2 (max. sig.), 9; Gm, 7100; Rp, 18300; RL, 2600; PO, 6.0 at 10% total harmonic distortion. ST-14 bulb, base diagram 7AC, same as 6V6G.

25D8GT, a remote cut-off pentode a high-mu triode and a diode all in one envelope.

25L6GT, same as 25L6G except for T9-D bulb.

25X6GT, full-wave high-vacuum rectifier. Ratings: Ef, 25.0; If, 0.15; Ep, 125 rms per plate; load current, 75 max. T9-D bulb, base diagram: 1, shell; 2, H; 3, P2; 4, K2; 5, P1; 7, H; 8, K1.

25Z6GT, same as 25Z6G except for T9-D bulb.

32L7GT, rectifier-beam power amplifier. Ef, 32.5; If, 0.3; power amplifier section: Ep, 90; Eg2, 90; Eg1, -7; Ip, 27; Ig2, 2.0; Rp, 17000; Gm, 4800; mu, 81; RL, 2600; PO, 1.0 at 9% total total harmonic distortion. Rectifier section: Ep, 125 ac rms max.; Ip, 60 max. T9-D bulb, base diagram 8F: 1, Kr; 2, H; 3, Pp; 4, G2; 5, G1; 6, Pr; 7, R; 8, Kp.

35A5, power amplifier pentode. Characteristics: Ef, 35; If, 0.160; Ep, 110 max.; Eg2, 110 max.; Eg1, -7.5 min.; Ip, 35; Ig2, 2.8; Rp, 25000; Gm, 5500; RL, 2500; Rc, 200; PO, 1.4 at 10% total harmonic distortion. T9-F bulb, loktal base, connections 6AA, same as 7C5.

35L6GT, beam power amplifier. Characteristics: Ef, 35.0; If, 0.15; Ep, 110 max.; Eg2, 110 max.; Eg1, -7.5; mu, 81; Rp, 13800; Gm, 5800; Ip (zero sig.), 40; Ip (max. sig.), 41; Ig2 (zero sig.), 3; Ig2 (max. sig.), 7; RL, 2500; PO, 1.5 at 6.5% total harmonic distortion. T9-D bulb, base diagram 7AC, same as 6V6G.

35Z4GT, half-wave high-vacuum rectifier. Ratings: Ef, 35.0; If, 0.15; Ep, 250 ac rms max. if series resistor of 100 ohms is used otherwise 125 volts ac rms max. Peak inverse voltage, 720 max.; Ip peak, 600; output current, 100 max. T9-D bulb, base diagram 5AA: 1, NC; 2, H; 3, NC; 5, P; 7, H; 8, K.

35Z5GT, cathode type half-wave rectifier with tapped heater. A pilot lamp can be lit to full brilliancy by connecting it across a section of the heater (between pin 2 and 3). It is

recommended that in such cases the load current be passed through the pilot lamp and the tapped heater section. This is accomplished by connecting the plate to pin 3 and the high side of the line to pin 2, the cathode becomes the positive side of the load as usual. Ratings: Ef, 35.0; If, 0.15; Ep, 125 ac rms max.; load current with No. 40 or 40A pilot lamp, 50 max.; with No. 50 or 51 pilot lamp, 60 max.; without pilot lamp, 100 max.; average tube voltage drop, 16; input filter condenser, 40 mid. max. The voltage between pins 2 and 3 should not exceed 5.2 volts when a pilot lamp is used. This should be measured with a thermal meter, not with a rectifier type. When the filament is not tapped, a 25 ohm resistor should be connected in series with the plate. T9-D bulb, base diagram: 1, NC; 2, H; 3, heater tap; 4, NC; 5, P; 7, H; 8, K.

45Z5GT, same as 35Z5GT except for heater ratings: Ef, 45.0; If, 0.15.

50L6GT, beam power amplifier. Characteristics: Ef, 50.0; If, 0.15; Ep, 110 max.; Eg2, 110 max.; Eg1, -7.5; mu, 82; Rp, 0.01; Gm, 8200; Ip (zero sig.), 49; Ip (max. sig.), 50; Ig2 (zero sig.), 4; Ig2 (max. sig.), 11; RL, 2000; PO, 2.2 at 10% total harmonic distortion. T9-D bulb; base diagram 7AC, same as for 6V6G.

70L7GT, half-wave rectifier and beam power amplifier. Ef, 70; If, 0.15; power amplifier section: Ep, 110; Eg2, 110; Eg1, -7.5; Ip, 40; Ig2, 3.0; Rp, 15000; Gm, 7500; RL, 2000; PO, 1.8. Rectifier section: Ep, 125 ac rms max.; output current, 70 max. Bulb T9-D, base diagram 8AA: 1, Kr; 2, H; 3, Pp; 4, G2; 5, G1; 6, Kp; 7, H; 8, Pr.

117Z6G, indirectly heated full-wave rectifier with separate cathodes and center-tapped heater. Ratings: Ef, 117; If, 0.075; max. heater to cathode voltage, 350; max. peak inverse voltage, 700; tube voltage drop at 120 ma per plate, 15.5. Operating conditions and characteristics: Ep, 235 ac rms max. with minimum plate impedance of 100 ohms per plate; without series resistance, the maximum ac voltage per plate is 117; d.c. output current per plate, 60 max. Voltage doubler: Ep max. per plate, 117 rms; dc output current, 60 max.; peak plate current, 350 max. The two heater sections may be operated in parallel on 58.5 volts; the heater current is then 0.15 ampere. T9-B bulb, base diagram: 1, heater center tap; 2, H; 3, P1; 4, K1; 5, P2; 7, H; 8, K2.

957, acorn triode. Characteristics: Ef, 1.25; If, 0.05; Ep, 135 max.; Eg, -5; Ip, 2; Rp, 24600; mu, 16; Gm, 650. The terminals fit the standard acorn socket; connections are the same as for type 955 except that the terminal between the two filament terminals is connected to the negative side of the filament.

958, acorn triode. Ef, 1.25; If, 0.10; Ep, 135 max.; Eg, -7.5; Ip, 3; Rp, 10000; mu, 12; Gm, 1200. Connections are the same as for 957.

959, acorn sharp cut-off pentode. Characteristics: Ef, 1.25; If, 0.05; Ep, 135 max.; Eg2, 67.5 max.; Eg1, -3; Ip, 1.7; Ig2, 0.4; Rp, 0.8; mu, 480; Gm, 600. Terminal connections are the same as for type 954 except that the terminal between the two filament terminals is connected to the negative side of the filament.

1620, a triple grid amplifier tube especially designed for applications requiring a minimum of microphonics and noise. Characteristics and physical construction are the same as those of type 6J7.

1621, power amplifier pentode similar to 6F6 but especially designed for low distortion and continuity of service.

1622, beam power amplifier similar to 6L6 but especially designed for low distortion and continuity of service.

7000, pentode amplifier similar to 6J7G, especially designed for low noise, low hum and minimum microphonics.

7700, same as 7000 except for physical construction similar to 6C6.

HY113, junior bantam general-purpose triode. Ef, 1.4; If, 0.070; Ep, 90; Eg, -7.5; Ip, 2.0; Gm, 500; mu, 6.3; Rp, 12600; R1, 20000; PO, 0.0175. Special small bulb, special five-pin base; connections: 1, F+; 2, P; 3, G; 4, NC; 5, F-.

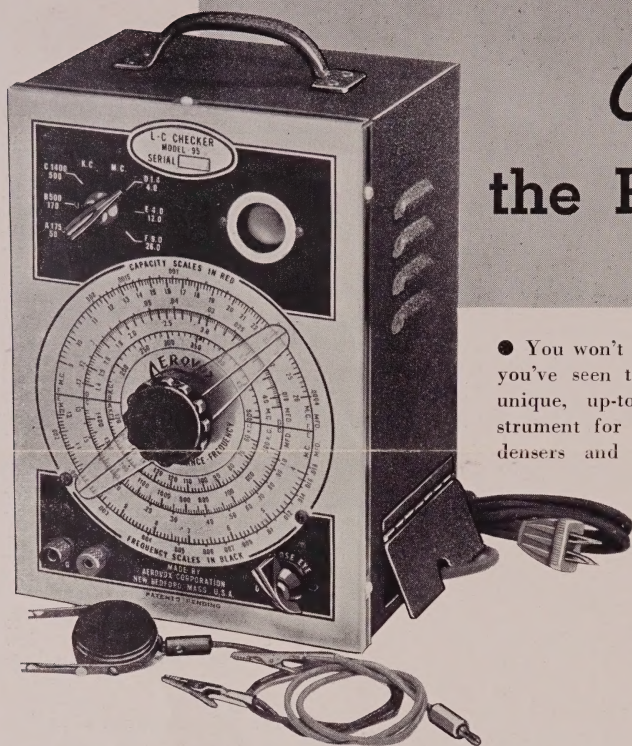
HY114, special ultra-high frequency triode tube of very small dimensions and having both plate and grid brought out to caps. Characteristics: Ef, 1.4; If, 0.12; Ep, 180 max.; Ip, 15 max.; plate dissipation, 2.5 max.; mu, 20; Gm, 1000; Rp, 20,000. The base fits a standard octal socket the connections are the same as for the HY615.

HY115, junior bantam pentode with sharp cut-off. Characteristics: Ef, 1.4; If, 0.070; Ep, 90; Eg2, 45; Eg1, -1.5; Ip, 0.48; Ig2, 0.1; mu, 370; Gm, 270; Rp, 1.3. The base fits a special five pin socket with the following pin arrangement: 1, F+; 2, P; 3, G1; 4, G2; 5, F-.

HY125, junior bantam pentode power amplifier. Characteristics: Ef, 1.4; If, 0.070; Ep, 90; Eg2, 90; Eg1, -7.5; Ip, 2.6; Ig2, 0.5; mu, 190; Gm, 450; Rp, 0.42; RL, 28000; PO, 0.09 at 10% total harmonic distortion. Bulb, same as for HY113 and HY115; base diagram, same as for HY115.

Data for the above list were supplied by the manufacturers: Rcturus, Hytron, Kenrad, Raytheon, RCA and Sylvania.

Checking the RADIO Way



● You won't believe such things can be done until you've seen the L-C Checker *in action*. Here's a unique, up-to-the-minute, simple, inexpensive instrument for the serious radio worker. Tests condensers and inductances in the radio-frequency range, under conditions simulating *actual working conditions*. Determines effectiveness of capacity or inductance *while actually connected in its circuit*. It's a true checking—the *radio way*.

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Completely self-contained. Operates on 105-130v. AC, or DC. Six-coil oscillator covers 60-170, 170-490, 490-1500 kc., and 1.5-4.6, 4.5-15, and 13-26 mc. Only 4¾ lbs. 10½ x 7½ x 5½ in. Handsome panel. Steelcase, black wrinkle and satin-aluminum finish.

Tests combinations of inductance and capacitance thereby determining resonant frequency of combinations and operating effectiveness of circuits. Can be used to adjust circuit or system to proper operating efficiency.

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Simplifies alignment of r.f. circuits, both broad and narrow band u.f. amplifiers. Aids in tracking of super-het. oscillator and tuning of wave traps of image-rejection circuits; checks frequency ranges of receivers. Checks calibration of wave meters.

Checks identifying harmonics of frequency

standard in precision frequency calibration of radio equipment.

Checks natural resonant points of r.f. chokes making sure they are beyond operating range.

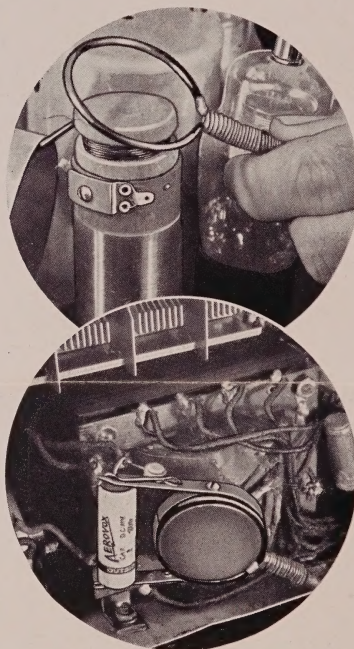
Traces resonant absorption trouble in "all-wave" receiver circuits—locating dead spots, etc. Locates resonant points in shorted windings (unused coils) in multi-range oscillators, etc.

Locates resonant frequency of r.f. coupling chokes, making sure of placement to secure enough gain balance over tuning range of r.f. stage.

Checks natural period of antennae and transmission lines. Determines resonant peaks and current loops.

Serves many other functions, especially if auxiliary equipment is used. Elaborate manual with each instrument covers its many uses.

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